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Original Research Article

Analysis Between Propofol and Sevoflurane in Causing Postoperative Delirium in Geriatric Patients

Kottam Rajeeth Kumar Reddy[1], Pujala Umapathy[2]

[1]Assistant Professor, Anaesthesia, SVS Medical College, Yenugonda, Mahabubnagar, Telangana – 509001

[2]Associate Professor, Anaesthesia, SVS Medical College, Yenugonda, Mahabubnagar, Telangana - 509001

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Corresponding author: Dr. Pujala Umapathy

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Abstract:

Introduction: Delirium after surgery is a typical complication in the elderly, posing unique difficulties. Depending on the type of surgery and the patient group, its occurrence might be anywhere from 9 percent to 87 percent. Patients' functional decline, length of hospital stay, financial burden, and risk of death are all negatively impacted by delirium, making its recognition and management all the more important.

Aims and objectives: This research aims to evaluate the effects of propofol and sevoflurane anaesthesia on the risk of postoperative delirium in elderly individuals undergoing surgery.

Methods: This study conducted during the period of one year. The study included 70 people were set to undergo THR/TKR procedures in our hospital's outpatient clinic. They were tested mentally and physically before surgery to ensure everything was in order. Patients were given midazolam, sufentanil, cisatracurium, propofol, and methylprednisolone while undergoing surgery. The secretion in the airways was reduced with atropine. Anaesthesia was kept up with propofol or sevoflurane while being tracked by BIS. Furthermore, Delirium was diagnosed by meeting certain criteria, except for the third or fourth.

Result: 70 patients participated in the study, and they were split into two groups: one received propofol, and the other received sevoflurane. There was no statistically significant difference between the two groups in terms of the incidence or severity of postoperative delirium. The duration of delirium was significantly reduced for those who were given sevoflurane as opposed to those who were given propofol.

Conclusion: Further research is needed to confirm if propofol anaesthesia causes more postoperative delirium than sevoflurane anaesthesia, as this study suggests.

Keywords: Propofol, Sevoflurane, Delirium, Geriatric Patients.

Introduction

With an ageing society, perioperative problems particular to senior patients are becoming more important. A classic geriatric consequence is postoperative delirium (Inouye et al., 2007). According to the patient population and the amount of stress associated with operations, the incidence varies from 9% to 87%. Because surgical delirium is linked to negative outcomes, including functional deterioration, longer hospital stays, institutionalisation, higher expenses, and increased mortality, it is crucial to identify it and treat This study aims to discuss

postoperative delirium diagnosis and management [1]. There are several potential causes of postoperative delirium. The risks can be divided into risk factors for the patient and the procedure. older age, functional disability, more co-morbidities, pre-existing dementia & psychopathological symptoms are all known specific to patients for the occurrence of delirium after non-cardiac surgeries. The strongest indicator of the onset of postoperative delirium appears to be the presence of pre-existing dementia when all preoperative danger signs are included. Based on the level of surgical stress, there are operation-specific risk indicators for the emergence of postoperative delirium [2]. In contrast with high surgical risk operations like vascular surgeries, which cause delirium in 36% of instances, moderate operating stress procedures like cataract surgery cause delirium in only 4% of cases. when a patient has many risk factors for delirium, the surgeon should put in place supporting and environmental changes that have been shown to postpone the onset and reduce the duration of delirium [3]. Delirium is characterised as a sharply altered and variable mental status accompanied by symptoms of apathy and a changed awareness level. Defined as a problem in mental processes that affect cognition in regard to memory, understanding, and focus. Afterwards, cognitive impairment should be separated from delirium. The clinical staff fails to recognise more than 50% of delirium cases in inpatient treatment. The physician can identify the existence of delirium by being aware of the three motor forms of delirium. First, agitated, irritated, or restless patients have hyperactive delirium. Second, lethargy, diminished motor activity and attentiveness, and unawareness are symptoms of hypoactive delirium. Third, the mixed type of delirium following surgery exhibits both hyperactive and hypoactive delirium traits [4]. Hypoactive postoperative delirium is more common (71%), mixed postoperative delirium is 29%, and hyperactive delirium is uncommon. Using current delirium evaluation techniques, a diagnosis of delirium is established. For measuring delirium, the Cognitive Evaluation Method-Intensive Care Unit (CAM-ICU) is a simple technique that has established reliability and validity. The CAM-ICU incorporates a patient evaluation level of awareness or sedation with assessments of their mental health, lack of concentration, disturbed awareness and disordered thoughts. A 10-point scale called a Richmond Agitation and Sedation Score offers distinct The CAM-ICU uses parameters for levels of sedation & agitation to calculate the quantity of sedation. All patients run the risk of developing postoperative delirium if they have various red flags (over 65, cognitive impairment, several co-morbidities, etc.). They should undergo the CAM-ICU every day. Another instrument for evaluating cognitive state includes the Mini-Mental State Examination (MMSE) [5]. The MMSE tests direction, attention, computation, recollection, and language, enabling the detection of cognitive impairment and the tracking of changes over time [5]. The Executive Clock Drawing Task, the Elderly Cognitive Decline Questionnaire from the Informant, & the Memorial Delirium Assessment Scale are further bedside assessments to determine whether delirium is present. Delirium is most likely caused by an imbalance in the neurotransmitters' production; both release and inactivation are typically in charge of regulating mood, behaviour, and cognition. Acute neurotransmitter imbalance alterations in oxidative metabolism and inflammatory markers in vivo processes inside the body all contribute to its augmentation [6]. The onset of delirium specifically involves three neurotransmitter systems: glutaminergic, dopaminergic, and cholinergic pathways. higher levels of dopamine and decreased levels of acetylcholine (producing higher

neuronal excitability) are frequently mentioned as contributing factors to the numerous hypotheses presented for the onset of delirium. The creation of tryptophan, a precursor to serotonin and melatonin, is involved in the progression of delirium. by inhibiting tryptophan, phenylalanine is also linked to the onset of delirium and lowers serotonin and melatonin levels. The blood-brain barrier is actively crossed by phenylalanine, which is then transformed into DOPA to cause delirium [7]. Interleukin-1 (IL-1), IL-2, IL-6, tumour necrotic factor, and interferon are among the cytokines released due to the inflammatory response. This prothrombotic condition might result in decreased cerebral blood flow, which may result in delirium. Additionally, it raises dopamine levels while lowering acetylcholine levels. Additionally, it influences how permeable the brain-blood barrier is. The cerebral cortex passes information through the thalamus, which acts as a filter in a healthy person [8].

Thalamic dysfunction brought on by a neurotransmitter imbalance brought on by the condition or treatment progresses to delirium. The most often linked substances to the onset of delirium are opioid and anticholinergic medications. The opioids, in particular meperidine, change the levels of the neurotransmitters acetylcholine and serotonin and may cause delirium due to its direct neurotoxic and anticholinergic action (its metabolite, normeperidine may also cause indirect effects) [9]. Post-operative anaesthesia disrupts sleep, which causes acetylcholine depletion and reduced melatonin production, which causes delirium. Uncertainty surrounds how anaesthesia contributes to the onset of delirium. According to a new meta-analysis, general anaesthesia increases the chance of post-operative cognitive impairment more than regional anaesthetic. Hypoxemia brought on by the lingering effects of non-depolarizing muscle relaxants is a reasonable explanation for the higher prevalence of delirium after general anaesthesia. Drugs that have been linked to delirium include H2-antagonists, anticholinergics, digitalis, a phenytoin, lignocaine, immigrants' antihistamines (hydroxyzine), and antihypertensives (b-blockers, methyldopa) are all substances that depress the central nervous system. These medications should be used with caution. Uncertainty surrounds how anaesthesia contributes to the onset of delirium. According to a recent meta-analysis, general anaesthesia possesses a higher risk of postoperative cognitive impairment than regional anaesthetic [10]. Hypoxemia brought on by the lingering effects of non-depolarizing muscle relaxants is a reasonable explanation for the higher prevalence of delirium after general anaesthesia. Drugs that have been linked to delirium include H2-antagonists, anticholinergics, digitalis, which is a drug called lignocaine, immigrants' antihistamine (hydroxyzine), & antihypertensive (b-blockers, methyldopa) are some of the medications used to treat hypertension. all substances that depress the central nervous system. These medications should be used with caution. The initial phase of therapeutic intervention for the care of delirious patients should be the formulation of pre-operative plans. The patient is often given clocks, calendars, and periodic re-orientation materials to provide a peaceful and tranquil atmosphere. A familiar family environment, fewer room & staff changes, and fewer nighttime interruptions all contribute to undisturbed sleep and the maintenance of healthy sleep-wake cycles [11]. The main objectives of pharmacological treatment for delirium are prevention (to stop delirium from happening) or therapeutic management (after delirium has already happened). Eliminating reversible delirium causes like hypoxia, hypoglycemia, infection, & sepsis is important before beginning the medication. Pharmacological treatment ought to be saved for those who pose a threat to both themselves and others.

Lorazepam 1-2 mg IV every 2-4 hours is helpful in managing agitation in alcohol withdrawal syndrome. It has been determined that the use of benzodiazepines in some patient subgroups is a separate risk factor for the onset of delirium. Anti-cholinergic syndrome-induced delirium can be treated with physostigmine [12].

In people with alcoholism, vitamin B12 might serve as a substitute. Dexmedetomidine, a more recent alpha 2 agonist, looks to be a potentially superior drug for sedation and anxiolysis with respiratory depression. Importantly, research suggests that various anaesthetics used during the same operation may result in varying occurrences of postoperative neurocognitive impairment. Sevoflurane anaesthesia specifically increased the risk of delayed neurocognitive recovery in cancer surgery patients compared to propofol anaesthesia [13]. Additionally, compared to patients who underwent the same operation under propofol anaesthesia, individuals who underwent radical rectal resection under sevoflurane anaesthesia experienced postoperative cognitive dysfunction (POCD) with a greater severity. Following surgery under isoflurane anaesthesia, patients with the ApoE 4 genotype more frequently exhibited late postoperative cognitive impairment. Postoperative delirium in patients: occurrence, course, and severity are still completely understood, as is the impact of anaesthetic type (for example, inhalation vs intravenous anaesthetic) [14].

Methods

Study design

There are a total of 70 individuals intended to undergo general anaesthesia for elective THR/TKR surgeries anaesthesia at our hospital's outpatient facility. 35 subjects were split between the sevoflurane and propofol anaesthesia groups. Since the beginning of the current, there haven't been any significant modifications made to anaesthesia or surgical procedures.

Two to three days before their planned surgery, participants were hospitalised. Preoperative evaluations were carried out on the day before the procedure. Aside from clinical features like diagnosis, prior medical history, the kind of surgery, Charlson Comorbidity Index (CCI) scores, Bispectral Index (BIS) values, anaesthesia and surgery duration, and others, the evaluations also included demographic characteristics like age, height, gender, weight, and period of education. The MMSE, which contains 19 items, was used to evaluate preoperative cognitive performance with a score of 30.As part of regular anaesthesia care, 1-2 mg of midazolam was given to each patient prior to surgery. For analgesia, amnesia, and muscular relaxation, Sufentanil 0.5–1 g/kg, cisatracurium 0.5 mg/kg, and propofol 2 mg/kg were administered employed, respectively. For the purpose of Methylprednisolone (40-80 mg) was administered to each patient to prevent a possible allergic response brought on by the placement of bone cement. To be able to lessen airway secretion, atropine (0.25 to 1 mg) was lastly administered to each patient. Propofol or sevoflurane was administered to maintain the anaesthesia, and BIS monitoring was utilised to gauge its depth.

Each participant had CAM and CAM-based scoring procedure for delirium severity (CAM-S) evaluations twice daily between 8:00 & 10:00 am and again between 4:00 and 6:00 pm on all three initial postoperative days.

The CAM algorithm comprises four criteria: acute onset and shifting course, inattention, disorganised pondering, and altered level of awareness. A side from the third or fourth condition, the first or second criterion must all be met in order to recognise delirium.

Inclusion and exclusion criteria

At least 60 years old, planned for surgery under general anaesthesia, and in classes I through III according to the American

Society for Anesthesiologists (ASA), having Chinese Mandarin as their common language, scoring over twenty-four on the Mini-Mental State Examination (MMSE) with a normal cognitive function at the time of enrollment, and having the ability to communicate verbally and in writing so they could provide information were the inclusion criteria for participants.

The Confusion Assessment Method (CAM) for assessing pre-existing delirium, the ICD-10 for diagnosing previous neurological conditions such as Parkinson's disease and stroke, and the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) for diagnosing previous mental conditions such as acute episodes schizophrenia, major depressive disorder, and mental retardation, Impaired eyesight or hearing that could affect the assessments, reluctance to engage in the study were excluded from the study.

Statistical analysis

Effective statistical analysis was performed on the study using SPSS 25. While discrete data were expressed as frequency & its corresponding percentage, continuous data were reported as mean ± standard deviation.

The statistical method used by the research for its analysis was ANOVA. The threshold for significance was considered at $P < 0.05$.

Ethical approval

Each patient's permission was obtained, and the consent form was collected from each one of them. The concerned hospital's Ethical Committee approved the study methodology.

Results: Table 1 shows that 70 participants were a part of the research and split into two groups: propofol and sevoflurane, with 35 participants in each group.

Demographic characteristics of the participants were assessed includingthe length of surgery and anaesthesia, amount of blood lost, MMSE score, PCA pump, and medications used. There seems to be there is little variation in the level of anaesthesia across participants under propofol and sevoflurane, determined by BIS.

Table 1: Baseline characteristics of the patients in each group

Variables (N=70)	Propofol (n=35)	Sevoflurane (n=35)	P value
Age (yr)	71.3 ± 6.9	71.9 ± 7.0	0.639
BMI (kg/m2)	25.9 ± 3.9	26.7 ± 3.7	0.658
Education	8.1 ± 4.9	8.2 ± 4.7	0.064
CCI	3.7 ± 1.4	3.9 ± 1.5	0.0745
ASA classification, n (%)			
I	1 (2.8)	2 (5.7)	0.644
II	30 (85.7)	27 (77.1)	
III	4 (11.4)	7 (20)	
BIS value	50.1 ± 10.1	49.8 ± 9.9	0.860
Anaesthesia duration (min)	128.9 ± 33.9	132.9 ± 44.1	0.478
Blood loss (mL)	232.1 ± 184.9	238.7 ± 230.9	0.699
Length of surgery (min)	92.2 ± 64.5	98.9 ± 39.8	0.358
Sufentanil	30.9 ± 11.9	29.3 ± 10.7	0.352
Methylprednisalone (mg)	56.4 ± 19.9	55.5 ± 19.8	0.751
Cisatracurium (mg)	24.5 ± 9.8	23.6 ± 8.7	0.573
Midazolam (mg)	1.7 ± 0.8	1.7 ± 0.9	0.708
Atropine (mg)	0.8 ± 0.3	0.9 ± 0.4	0.623
PCA pump usage, n (%)	30 (85.7)	27 (77.1)	0.317
Baseline MMSE	26.5 ± 1.9	26.5 ± 2.2	0.577

Postoperative MMSE	25.6 ± 3.4	25.9 ± 3.5	0.799
Preoperative VAS score	5.9 ± 2.5	6.5 ± 2.5	0.390
Postoperative day 1 VAS	5.0 ± 2.6	5.9 ± 2.5	0.039
Postoperative day 2 VAS	5.3 ± 2.5	5.4 ± 2.4	0.570
Postoperative day 3 VAS	4.5 ± 2.5	4.9 ± 2.3	0.276

Table 2 presents the outcome determination of the prevalence and severity of postoperative delirium in two groups: the Propofol group (n=35) and the Sevoflurane group (n=35). The table includes three variables: postoperative delirium incidence, the score for the severity of postoperative delirium, and the number of days of delirium following surgery.

Regarding postoperative delirium incidence, the table shows that 12 out of 35 patients (34.3%) in the Propofol group experienced delirium, while 9 out of 35 patients (25.7%) in the Sevoflurane group had delirium. However, the p-value associated with this comparison is 0.120, indicating that the difference in delirium incidence between the two groups is not statistically significant. The next variable, the score for the severity of postoperative delirium, reveals that the Propofol group had an average score of 2.8 ± 1.4, while the Sevoflurane group had an average score of 2.5 ± 1.4. The p-value associated with this comparison is 0.365, suggesting that there is no significant difference in the severity of postoperative delirium between the two groups. Lastly, the table displays the number of days of delirium following surgery. The Propofol group had an average of 0.7 ± 0.9 days of delirium, while the Sevoflurane group had an average of 0.6 ± 0.8 days. The p-value associated with this comparison is 0.050, indicating a marginally significant difference in the number of days of delirium between the two groups. Based on the data presented in the table, there is no significant difference in the incidence and severity of postoperative delirium between the Propofol and Sevoflurane groups. However, there is a marginally significant difference in the number of days of delirium following surgery, with the Sevoflurane group having a slightly shorter duration of delirium than the Propofol group.

Table 2: Outcome determination of the prevalence and severity of postoperative delirium in the sevoflurane and propofol groups

Variables	Propofol (n=35)	Sevoflurane(n=35)	p-value
Postoperative delirium incidence, N	12 (34.3)	9 (25.7)	0.120
Score for the severity of postoperative delirium	2.8 ± 1.4	2.5 ± 1.4	0.365
Days of delirium following surgery, N (%)	0.7 ± 0.9	0.6 ± 0.8	0.050

Discussion

Negative surgical outcomes are linked to postoperative delirium. It is uncertain, however, if the dangers of postoperative delirium are different for intravenous and inhalation anaesthetics. Our goal was to ascertain if older patients who underwent surgery while being sevoflurane or propofol inhaled experienced postoperative delirium and its frequency [15]. Postoperative delirium is associated with poor surgical results. However, whether intravenous or inhalation anaesthetics provide distinct risks for postoperative delirium is unclear. The study aimed to examine the potential for postoperative delirium in elderly adults undergoing surgery while receiving sevoflurane or propofol inhalation [16].

The selection of general anaesthetics could impact the cognitive results following surgery. The study's objective was to compare the potential effects of sevoflurane

vs propofol-based general anaesthesia on the frequency of delayed neurocognitive recovery in aged people persons immediately following extensive cancer surgery. older patients (65 to 90 years old) who need serious cancer surgery (lasting less than two hours) were randomised to receive sevoflurane- and propofol-based general anaesthetic [17]. Before and after the study, a set of neuropsychological assessments were utilised to assess cognitive performance. one week after surgery. To account for the learning impacts from repeated testing, non-surgical controls that were matched for age and education were chosen, and their cognitive abilities were assessed at similar intervals. Based on the International Research on Postoperative Cognition Dysfunction 1 definition, delayed neurocognitive recovery was identified. Propofol-based general anaesthesia may lessen the prevalence of post-major cancer surgery delayed neurocognitive restoration in older persons as compared to sevoflurane-based general anaesthesia [18]. Postoperative delirium (POD) constitutes a frequent anaesthesia-related consequence. POD enhances the mortality and morbidity of older individuals and has a prevalence of 37% to 53% in this population. However, nothing is known about how anaesthetics affect POD. The current study aimed to investigate the prevalence of POD brought on by sevoflurane and propofol anaesthesia. Compared to sevoflurane anaesthesia, propofol anaesthesia had a considerably lower incidence of POD (6.9% vs 26.7%; 038). Propofol anaesthesia is linked to a decreased rate of POD in older individuals when compared to sevoflurane anaesthesia [19].

To determine finding possible POCD indicators in this patient group, as well as the frequency in older surgical patients (>60 years) under varied anaesthesia (propofol, sevoflurane, and isoflurane) with postoperative cognitive dysfunction (POCD). The clinical trial that is prospective, randomised, and double-blind. Anaesthesia with propofol, sevoflurane, and isoflurane was randomly allocated to elderly patients with laparoscopic cholecystectomy. For older surgical patients, propofol anaesthesia may be an alternative [20]. In senior individuals, post-operative psychological disorders may be a serious issue. In the present study, the impacts of sevoflurane with propofol were contrasted. anaesthesia on postoperative delirium (POD) incidence and recovery parameters during extensive laparoscopic surgery on elderly patients. For the induction and upkeep of general anaesthesia, 50 ASA physical status I-II patients over 65 who had been scheduled to undergo Propofol or sevoflurane were given to patients undergoing laparoscopic surgery for at least three hours (group P, n = 25). Continuous preoperative epidural analgesia was given to both groups [21]. The dosage of primary anaesthetics was changed to keep variations within 20% for pre-anaesthetic levels for mean arterial pressure. During the first three days following surgery, Eye-opening, extubation, responsiveness to instruction, and orientation were recorded when the patient emerged from anaesthesia. Then the presence of POD was assessed utilising a delirium rating scale (DRS). Following surgery, every patient had ongoing epidural anaesthesia and oxygen. When used with epidural analgesia for long-lasting laparoscopic surgery on older patients, sevoflurane may be preferred to propofol since it less impacts mental function in the early postoperative period [22]. Compare POD frequency in elderly patients undergoing spine surgery under sevoflurane and propofol anaesthesia. In the present research, sevoflurane or complete intravenous anaesthesia with propofol was used for inhalational anaesthesia during spine surgery on senior patients over the age of 65. The number of cases of POD following anaesthesia based on propofol and sevoflurane served as the primary outcome. Secondary outcomes

included 30-day complications following surgery, length of hospital stay following surgery, associations between patient characteristics, data from surgery and anaesthesia, and POD development, and associations between anaesthetics and clinical outcomes like 30-day complications following surgery and length of hospital stay following surgery. In elderly patients undergoing spine surgery, propofol-based anaesthesia was linked to a reduced incidence of POD versus sevoflurane-based anaesthesia [23]. Whether electroencephalography monitoring of anaesthesia dosage titration minimises postoperative delirium is the subject of recent contradictory experiments. Titration to the anaesthetic dosage alone might produce clearer results. We evaluated our observational cohort to clarify the dosage ranges for anaesthetic dose trials and the biological plausibility for anaesthetic dose impacting delirium. The degree or occurrence of delirium was not related to the sevoflurane dosage. Sevoflurane dosage is less likely to cause delirium than other biological processes, including inflammation and neuronal damage [24]. Due to patients with Parkinson's disease (PD) having a reduced level of cognitive reserve, the choice of maintaining the level of general anaesthesia may affect how often postoperative delirium (POD) occurs. The present research sought to determine if sustaining general anaesthesia with propofol or sevoflurane would impact whether POD would develop in Parkinson's disease (PD) patients after deep brain stimulation surgery or DBS. In the current investigation, POD frequency in PD patients having brain stimulation surgery was equivalent under general anaesthesia based on propofol and sevoflurane [25].

The most prevalent neuropsychological side effect of general anaesthesia in elderly adults is postoperative delirium (POD). An intraoperative electroencephalogram (EEG) shows persistent burst suppression activity during POD formation. In addition to the patient's age, propofol anaesthesia is associated with a higher risk of burst suppression activity than is inhalative anaesthesia. Our study's objective is to ascertain if the risk of POD varies based on the anaesthetic drug used and whether this is associated with a longer period of intraoperative bursting suppression. Even though the length of burst suppression was shorter with desflurane than with propofol, we discovered a considerably higher incidence of POD in older individuals after desflurane anaesthesia. Our research may clarify some differences between studies examining the effect of burst suppression length and EEG-guided anaesthesia on the likelihood of developing POD [26].

The selection of general anaesthesia may influence the cognitive results following surgery. The study's objective was to investigate any potential impacts of general anaesthesia based on propofol vs sevoflurane on the prevalence of post-major cancer surgery delayed neuropsychological recovery in adults over the age of 65. Sevoflurane or propofol-based general anaesthesia was randomly assigned to older patients (65 to 90) who required severe surgery for cancer (lasting a maximum of two hours). Anaesthetic. Before and after the study, a set of neurological assessments were utilised to assess cognitive performance. one week after surgery. To account for the learning impacts from repeated testing, non-surgical controls that were matched for age and education were chosen, and their cognitive abilities were assessed at similar intervals. Pursuant to the World Study of Perioperative Cognitive Dysfunction 1 definition, delayed neurocognitive recovery was identified [27].Propofol-based general anaesthesia may lessen the prevalence of post-major cancer surgery and delay neurocognitive recovery in older persons as compared to sevoflurane-based general anaesthesia. Postoperative delirium (POD) constitutes a frequent anaesthesia-related consequence.

POD enhances both the mortality and morbidity of older individuals and has a prevalence of 37% to 53% in this population. However, nothing is known about how anaesthetics affect POD. The current study aimed to investigate the frequency of POD brought on by sevoflurane and propofol anaesthesia.30 patients underwent anaesthesia with sevoflurane, whereas 29 underwent anaesthesia with propofol. Compared to sevoflurane anaesthesia, propofol anaesthesia had a considerably lower incidence of POD (6.9% vs. 26.7%; 038). Propofol anaesthesia is linked to a decreased rate of POD in older individuals when compared to sevoflurane anaesthesia [28].

Conclusion

In conclusion, the findings of this study can be used as a starting point for evaluating how different anaesthetics, such as propofol and sevoflurane, affect patients' risk of postoperative delirium. Based on these findings, it appears that more extensive research is required to confirm or refute the hypothesis that propofol anaesthesia results in more severe postoperative delirium than sevoflurane anaesthesia. This analysis, conducted as a pilot project, helps doctors better understand the risks associated with giving patients unsatisfactory anaesthesia and putting them at risk for postoperative delirium. There are a few problems with the existing research that need fixing. The limited sample size contributed to the lack of statistically significant differences in the incidence and severity of postoperative delirium between the propofol and sevoflurane anaesthetic groups. A larger sample size could be considered for future studies to ensure statistical significance. Second, participants in this study could only be those who were scheduled to undergo total hip or knee replacement. It would be helpful for future studies to include patients undergoing diverse types of surgery, such as abdominal procedures, to ensure that the results apply to a wide range of surgical populations. Finally, because a baseline Mini-Mental State Examination (MMSE) score of 24 or more was required, subjects with severe cognitive dysfunction were excluded from this study. As a result, this study's results probably do not apply to those with cognitive impairment. Patients with varying levels of cognitive function should be included in future research investigating the effects of anaesthesia on postoperative delirium to generalise the findings to a wider range of patients.

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